N.J. DEPARTMENT OF ENVIRONMENTAL PROTECTION & ENERGY
Division of Responsible Party Site Remediation

TO: **Jonathan Josephs**
USEPA

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DATE: **11/19/93** NUMBER OF PAGES: 12 (inc. cover)

FROM: **Christina H. Purcell, Case Manager**

OFFICE: **Bureau of Federal Case Management**

PHONE #: **(609) 633-1455** FAX #: **(609) 633-1454**

Jon:

Attached please find the revised Proposed Plan. As discussed, nickel is not considered to be carcinogenic, unless you have info indicating otherwise. Most other comments were incorporated (pg 4 #9 implementability...kept as written). The Pilot Agreement was defined. Please note blurb on "EPA acceptance". I would appreciate comments by next Tues or Wed (before thanksgiving) ~~Please note that this document need to be re-formatted for aesthetic purposes~~. PLEASE call if you have any questions or need more time. Thank you.

-Christina

Superfund Proposed Plan

L. E. Carpenter & Company

Wharton Borough
Morris County, New Jersey

New Jersey
Department of Environmental Protection and Energy

November 1993

PURPOSE OF PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for the Dayco Corp./L. E. Carpenter Superfund site (hereinafter "L. E. Carpenter" or "site") and identifies the preferred remedial alternative with the rationale for this preference. The Proposed Plan was developed by the New Jersey Department of Environmental Protection and Energy (NJDEPE), as lead agency, with support from the U.S. Environmental Protection Agency (EPA). The NJDEPE is issuing the Proposed Plan consistent with the public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended (CERCLA), and Section 300.430(f) of the National Contingency Plan (NCP). The alternatives summarized here are described in the remedial investigation and feasibility study (RI/FS) reports which should be consulted for a more detailed description of all the alternatives.

This Proposed Plan is being provided as a supplement to the RI/FS reports to inform the public of NJDEPE's preferred remedy and to solicit public comments pertaining to all the remedial alternatives evaluated, as well as the preferred alternative.

The remedy described in this Proposed Plan is the preferred remedy for the site. Changes to the preferred remedy or a change from the preferred remedy to another remedy may be made, if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after NJDEPE has taken into consideration all public comments. We are soliciting public comment on all of the alternatives considered in the detailed analysis of the RI/FS because NJDEPE may select a remedy other than the preferred remedy.

COMMUNITY ROLE IN SELECTION PROCESS

NJDEPE rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI/FS reports, Proposed Plan, and supporting documentation have been made available to the public for a public comment period which begins on [enter public comment period start date] and concludes on [enter public comment period end date].

A public meeting will be held during the public comment period at the [meeting location] on [meeting date] at [meeting time] to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred remedial alternative, and to receive public comments.

Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document which formalizes the selection of the remedy.

All written comments should be addressed to:

Grace Singer, Chief
Bureau of Community Relations
NJDEPE
401 East State Street
CN 413
Trenton, NJ 08625-0413

Dates to remember:
MARK YOUR CALENDAR

[enter start and completion dates of public comment period]
Public comment period on RI/FS reports, Proposed Plan, and remedies considered

Wednesday, December 8, 1993
Public meeting at the Wharton Borough Municipal Building at 7:00 pm

Copies of the RI/FS reports, Proposed Plan, and supporting documentation are available at the following repositories:

Wharton Borough Municipal Building
10 Robert Street
Wharton, NJ 07885
(201) 361-8444

Wharton Public Library
1519 S. Main Street
Wharton, NJ 07885
(201) 361-1333

New Jersey Department of
Environmental Protection and Energy
401 East State Street
Trenton, NJ 08625
(609) 984-3081

SITE BACKGROUND

The L. E. Carpenter facility is located at 170 North Main Street, Borough of Wharton, Morris County, New Jersey. The site occupies approximately 14.6 acres northwest of the intersection of the Rockaway River and North Main Street. The Rockaway River borders the site to the south; a vacant lot lies to the east; and a large compressed gas facility (Air Products, Inc.) borders the site to the northeast. Additional industrial sites are located to the south of the site. The residential portion of the Borough of Wharton is separated from the site by Ross Street, which is located on the northwestern side of the site.

The site is located within the Dover Mining District. Iron ore was extracted from three mines in the vicinity of the site from the late 1800s to the early 1900s. The Washington Forge Mine and West Mount Pleasant Mine were located directly on what is currently the L. E. Carpenter Property. The mine was operated intermittently between 1850 and 1910. Several textile businesses were operated at the site prior to 1943 when L. E. Carpenter began operation.

The L. E. Carpenter facility produced of Vicrtex vinyl wall coverings from 1943 to 1987. The manufacturing process involved the generation of waste solvents including xylene and methyl ethyl ketone, the collection of solvent fumes via "smog-hog" condensers, the collection of particulate matter via a dust collector, and the discharge of non-contact cooling water to the Rockaway River. During the period of operation, the L. E. Carpenter facility operated several air pollution control devices permitted by NJDEPE and maintained a New Jersey Pollution Discharge Elimination System (NJPDES) Permit for the discharge of non-contact cooling water. From approximately 1963 until 1970, L. E. Carpenter disposed its wastes, including a polyvinyl chloride (PVC) waste material, into an unlined on-site impoundment. These waste impoundments were the main source of soil and ground water contamination at the site. The site was listed on the National Priorities List (Superfund) in April 1985.

L. E. Carpenter submitted a report to NJDEPE dated October 2, 1979, concerning the characterization of the PVC waste material disposed in the impoundment and an evaluation of remedial alternatives. The analysis report of the waste material indicated the presence of the following hazardous substances; di-n-butyl phthalate, diethyl phthalate, phenol, antimony, barium, cadmium copper magnesium, lead and zinc.

NJDEPE conducted soil and ground water sampling on August 18, 1980 and March 3, 1981. The analytical results of the soil samples indicated the presence of volatile organic compounds, base neutral compounds, metals and polychlorinated biphenyls (PCBs).

NJDEPE also sampled the ground water monitoring wells located at the site. The analytical results of these samples indicated that the ground water at the site was contaminated with immiscible (free floating) and dissolved pollutants including; 1,2-dichloroethane, trichloroethylene, toluene, ethylbenzene, styrene, dibromoethane, propyl benzene, xylene, cumene, mesitylene, cymene, tetrachloroethylene, tetrachloroethane, chlorobenzene, copper, lead, arsenic, zinc, antimony, barium and nickel.

NJDEPE has overseen site activities at the L. E. Carpenter site since 1982 under various Administrative Consent Orders (ACOs). Current site work is being performed under a September 26, 1986 ACO between NJDEPE and L. E. Carpenter. The Remedial Investigation was initiated in February 1989.

REMEDIAL INVESTIGATION SUMMARY

A summary of the investigation may be found in the Remedial Investigation report dated June 1990, the Supplemental Remedial Investigation Report dated November 1990 and the Final Supplemental Remedial Investigation Report dated September 1992.

Completed Remedial Programs

L. E. Carpenter implemented several remedial programs which addressed sources of contamination discovered during the remedial investigation. In 1982, L. E. Carpenter removed 4,000 cubic yards of sludge and soil from a former surface impoundment. Also, since 1982 L. E. Carpenter has sampled selected ground water wells on a quarterly basis. Since May 1984, more than 5000 gallons of floating product has been recovered from a series of recovery wells located primarily on the eastern side of the site. In 1991, the existing ground water recovery system was upgraded and three additional recovery wells were installed in order to enhance the removal of the

immiscible product. This passive system was currently upgraded again to maximize its recovery in October 1993. Specifically, three (3) large diameter cassion wells were installed to capture additional product. In 1989, an extensive asbestos removal was completed in Buildings 12, 13, and 14. All underground and inactive aboveground storage tanks were decommissioned and removed from the facility in 1990 and 1991 pursuant to procedures established by the NJDEPE Bureau of Underground Storage Tanks under an approved tank closure plan.

All drummed raw materials have been removed from the site. In September 1991, the interior of Building 9 and process piping, tanks and appurtenances in Building 13 were decontaminated. Excess material and wastes were disposed of off-site. In December 1991, Building 12 (former boiler house), 13 and 14 were razed.

Findings of the Remedial Investigation

SOIL

To facilitate remedial investigations, the site was divided into three areas of study based upon former operations in the different areas, specifically Area I, Area II, and Area III.

Area I is bounded by former Buildings 12, 13, and 14 and extends northeast along the railroad Right-of-Way (ROW) to the property near MW-13, extends approximately 300 feet, encompasses the Air Products property near MW-13, extends approximately 500 feet into the Wharton Enterprises property to encompass the abandoned sewer line, and along the Rockaway River to the steel penstock. Shallow soil samples were collected in approximately 26 locations. Deep soil samples were collected from a depth immediately above ground water (2 to 8 feet below ground surface (BGS)) at 63 locations.

Shallow soils indicate levels of bis (2-ethyl-hexyl) phthalate (DEHP) at concentrations up to 15,000 ppm. Three surface soil samples collected at the Wharton Enterprises property indicated levels of PCBs up to 45 ppm. Metals, specifically antimony and lead, were detected at the southeast perimeter of former building 13 and south of monitor well MW-9 at concentrations up to 413 ppm and 2230 ppm respectively.

Analysis of deep soil samples indicate levels of DEHP in concentrations up to 30,000 ppm in the area extending from former Buildings 13 and 14 in the west to the terminus of the abandoned sewer line in the east, and from the drainage ditch in the north to the Rockaway River in the south. VOCs, namely xylene at levels up to 460 ppm, and ethylbenzene up to 43 ppm were also detected. Lead and Antimony were detected at concentrations of 765 ppm and 423 ppm respectively.

Area II encompasses the western edge of Building 15 to the western edge of former Buildings 13 and 14 and the northern edge of Building 15 to the Rockaway River. A total of nine (9) shallow soil samples and four (4) deep (directly above the water table) were collected. Results indicate no contamination above the NJ soil cleanup criteria with the exception of one soil sample which indicated the presence of lead at a concentration of 2230 ppm.

Area III encompasses Buildings 8, 9 and 2, which border Ross Street and the Washington Forge Pond. A total of 18 shallow and 21 deep soil samples were collected. Area III deep soils investigation indicated elevated levels of base neutrals (BNs), mainly DEHP, at concentrations at 6,302 ppm west of Building 8. Shallow soil sampling results indicated concentrations of PCB from non-detect (ND) to 2.9 ppm in the starch drying bed area at the northern portion of the site. Elevated levels of Antimony were found at a concentration of 828 ppm adjacent to the loading dock at Building #9.

GROUND WATER

Results of the ground water investigation at the site has determined that the extent of contamination is located in Areas I and II and restricted to the shallow aquifer which flows in a northeasterly direction, towards the Air Products drainage ditch. Ground water contamination exists in both a floating product and dissolved phase and has migrated onto the neighboring property, Wharton Enterprises. The predominant volatile organic chemicals are xylene at levels up to 120,000 ppb, ethylbenzene at levels up to 26,000 ppb. The predominant base neutral is DEHP in concentrations from ND to 62,000 ppb. The existing floating product is being reduced using an on site passive recovery system. Metals, such as Arsenic and Antimony were detected in some of the ground water samples at concentrations up to an estimated concentration of 21.3 ppb and 540 ppb respectively.

ROCKAWAY RIVER AND AIR PRODUCTS DITCH

As part of the Remedial Investigation, surface water and sediment samples were taken to determine possible site impacts on the Rockaway River and sediments located adjacent to the river and the Air Products drainage ditch.

Air Products Drainage Ditch

The Air Products Drainage Ditch borders the L. E. Carpenter property on the north eastern portion of the property. The standing water located within the ditch eventually leads into the Rockaway River or percolates into groundwater during periods of low water table. Sediment sample results indicate detectable levels of Total Base Neutrals and Metals. The predominant BN was DEHP found in concentrations from ND to 520 ppm. The predominant Metals were arsenic at concentrations up to 25.7 ppm, chromium at concentrations up to 34.7 ppm, lead at concentrations up to 503 ppm, mercury at concentration up to 21 ppm, and zinc at concentrations up to 336 ppm. Surface Water samples indicate elevated levels of Volatile Organic Compounds. The predominant volatile

organic compound was xylene at a detected concentration of 44 ppb.

Rockaway River

The Rockaway River borders the site from the south western portion of the site up through the eastern portion. Sediment sampling results indicate elevated levels of Total Base Neutrals and Metals in samples on the eastern portion of the site. The predominant BN as DEHP found in concentrations from 1.6 ppm to 76 ppm. The predominant metals were antimony at concentrations up to 718 ppm, copper at concentrations up to 711 ppm and lead at concentration up to 339 ppm. Surface water samples indicated volatile organics at trace levels.

SUMMARY OF SITE RISK

Based upon the results of the RI, a baseline risk assessment was conducted to estimate the risks associated with current and future site conditions. The baseline risk assessment estimates the potential human health and ecological risk which could result from the contamination at the site if no remedial action were taken. Site risks are expressed in exponential terms when estimating the cancer risk. For example, 1×10^{-6} excess cancer risk estimate means that should a population of one-million (1,000,000) persons were exposed to the site contaminants in a specified manner, it is estimated that one additional person would develop cancer in excess of those that would develop cancer if not exposed to site contaminants. Risk of health effects other than cancer are expressed in terms of a calculated Hazard Index. A hazard index greater than one (1.0) for a population exposed to site contaminants in a specified manner would indicate a potential for health effects other than cancer.

Human Health Risk Assessment

The conservative estimate of reasonable maximum human exposure is evaluated. A four-step process is utilized for assessing site-related human health risks for a conservative estimate of reasonable maximum exposure scenario: *Hazard Identification*--identifies the contaminants of concern at the site based on several factors such as toxicity, frequency of occurrence, and concentration. *Exposure Assessment*--estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., drinking contaminated well-water) by which humans are potentially exposed. *Toxicity Assessment*-- determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response). *Risk Characterization*-- summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative (e.g., one-in-a-million excess cancer risk) assessment of site-related risks.

The baseline risk assessment selected site related contaminants of concern based on frequency of detection, toxicity and comparison to background levels. These contaminants included DEHP, antimony, PCBs, methylene chloride, benzene, ethylbenzene, polynuclear aromatic hydrocarbons (PAHs), chromium (hexavalent), 1,1-dichloroethane, 1,1-dichloroethene, tetrachloroethene, tricholoroethene, xylene, arsenic, lead, nickel. All of the above contaminants, except lead, antimony, ethylbenzene, xylene, and nickel are known to cause cancer in laboratory animals and are suspected to be human carcinogens. The chlorinated solvents such as 1,1,-dichloroethane, 1,1-dichloroethene, tetrachloroethene, tricholoroethene, are not considered to be site related.

The baseline risk assessment evaluated the health effects which could result from exposure to contamination if no action is taken to remediate sources of contamination as a result of:

* the ingestion, inhalation and skin contact with surface soil;
* ingestion, inhalation and skin contact with ground water
* incidental ingestion and skin contact with stream sediments;
* incidental ingestion and skin contact with surface water; and
* the consumption of contaminated animals (fish) from the Rockaway River.

Ground water is not currently used as a potable source at or within a 1 mile radius of the site. Therefore, human health risks associated with ingestion, inhalation and skin contact with contaminated ground water represents the hypothetical future use by a resident living on or directly adjacent to the site and using the ground water as a potable source. (see Table 1 and Table 2 attached)

Summary of Health Risks

Through a quantitative assessment of exposure pathways for the contaminants of concern, specific health risks levels were calculated to enable an evaluation of potential health risks for human receptors. The quantitative health risk evaluation identified the following potential health risk for each media:

SOIL

A cancer risk of 8.2×10^{-4} was established for an on-site employee; a cancer risk of 2.6×10^{-5} for a trespasser; and a cancer risk of 1.9×10^{-3} for a hypothetical future resident who is exposed to soil via incidental ingestion, inhalation and skin contact. The Hazard Index (HI) which reflects non carcinogenic effects for a human receptor was estimated to be 11 for an on-site employee, 2.1 for a trespasser, and 79 for a future resident.

GROUND WATER

A cancer risk was established for a hypothetical future resident for the ingestion, inhalation, and skin contact with ground water from the shallow, intermediate and deep zones who uses well water as a sole potable water source over a lifetime. The risks calculated are 4×10^{-4}; 1.3×10^{-4}; 4.0×10^{-4}; for shallow, intermediate and deep ground water respectively. The Hazard Index which reflects non-carcinogenic effects for the hypothetical future resident which ingests, inhales or has dermal contact with the ground water, was estimated to be 413 for shallow ground water, 4.4 for intermediate ground water and 6.2 for deep ground water. The carcinogenic and non carcinogenic risk for both intermediate and deep ground water have been determined to be an over estimation of the true conditions of the site because DEHP was only found to minimally exceed the Ground Water Quality Standards in one well in each aquifer.

In the intermediate ground water, DEHP and arsenic exceeded the 10^{-6} carcinogenic risk levels and exceeded a HI of 1.0. DEHP was detected in one well above the Ground Water Quality Standard. Arsenic was detected in 1 of 14 samples below the Ground Water Quality Standard.

In the deep ground water, DEHP and 1,2-dichloroethane (1,2-DCA) exceeded carcinogenic risk levels and/or a HI of 1.0. Each compound was detected in only 1 of 10 samples. 1,2-DCA was detected as an estimated value and is below the Ground Water Quality Standard. The DEHP concentration has only been reported in one deep well in the area were ground water contamination is the highest. Since the levels are not an order of magnitude higher than the Ground Water Quality Standard and have only been detected in one well, deep ground water does not warrant remediation.

RIVER SEDIMENTS

A cancer risk of 7.9×10^{-6} was established for a wader/swimmer who incidently ingests river sediments or through skin contact. The Hazard Index which reflects non-carcinogenic effects for a human receptor was estimated to be 0.32. The sediment samples taken at the Air Products drainage ditch were not included in this evaluation. The assessment determined that the ditch is inaccessible to the trespasser and too shallow to be used for wading and swimming. Therefore, the potential risk due to exposure to these sediments are negligible.

RIVER SURFACE WATER AND FISH CONSUMPTION

A cancer risk of 2.1×10^{-7} was established for ingestion and dermal contact of River Surface water. The Hazard Index which reflects non-carcinogenic effects for a human receptor was 0.013.

A cancer risk of 6.3×10^{-4} for consumption of fish was developed. The Hazard Index which reflects non-carcinogenic effects for a human receptor was estimated to be 1.6. However, the only contaminant contributing to the majority of the risk due to consumption of fish from the Rockaway River was arsenic. Arsenic was detected in two of four of the surface water samples from the Rockaway River at an estimated value. These estimated (J) values were used in the baseline risk assessment. This approach results in a conservative overestimation of risk. Based on available information and the conservative evaluation, control of fish consumption does not appear to be warranted.

These calculated health risks represent a reasonable maximum exposure which represent a summation of the chemical-specific risks associated with each medium being evaluated. EPA has established a carcinogenic risk range for cleanup of contaminated sites of 1×10^{-4} to 1×10^{-6} excess cancer risk and greater than 1.0 for non-carcinogenic risks. The Industrial Site Recovery Act (N.J. P.L. 1993 C193) requires that any proposed remedy must meet the cleanup criteria of 1×10^{-6}. The more conservative 1×10^{-6} is used for achieving final remediation.

Actual or threatened releases of hazardous substances from this site, if not addressed by the proposed alternative may present a current or potential threat to public health, welfare or the environment.

Based on the scenarios presented, the contaminants identified in soil and shallow ground water exceed the acceptable risk established by NJDEPE of 1×10^{-6} and the EPA target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic risk and the Hazard Index of 1.0. Other scenarios that exceed the hazard index; fish consumption, intermediate and deep ground water exposure, do not indicate a need for remediation based on NJDEPE evaluation. Human health effects of lead soil contamination were not quantified due to the non-conforming lead toxicity data. Therefore, levels of lead in soil were compared to the NJ Soil Cleanup Criteria. The NJ Soil Cleanup Criteria are health based remediation goals designed to provide for the protection of human health and the environment across the state.

Based on the site specific Risk Assessment the NJ Soil Cleanup Criteria and the Ground Water Quality Standards (NJAC 7:9-6 et seq) the Department has determined that the following media and contaminants at the L. E. Carpenter site need to be addressed:

* Contaminated soil - DEHP
* Soil hotspot areas - PCB, Lead and Antimony
* Contaminated ground water - Xylene, Ethylbenzene, DEHP

Ecological Risk Assessment

The purpose of the ecological assessment is to identify and estimate the potential ecological impacts from the release of contaminants on the aquatic resources in the Rockaway River, which is adjacent to the site.

The technical guidance for the performance of this risk assessment comes from several sources, including the *Endangerments Assessment Handbook* (EPA, 1986a); *Ecological Risk Assessment* (Urban and Cook, 1986); and the *Interim Final Risk Assessment Guidance for Superfund: Volume II Environmental Evaluation Manual* (EPA, 1989b).

The ecological risk assessment focused on the potential impacts that site related contamination may have on the aquatic resources of the Rockaway River. The ecological assessment evaluated whether aquatic organism were potentially adversely exposed to contaminants at concentrations in the sediments based on the National Oceanic and Atmospheric Administration (NOAA) sediment-sorbed contaminate data. Comparison of surface water contaminant concentrations in the Rockaway to the Ambient water quality criteria (AWQC) indicated the contaminant levels may potentially pose a threat to aquatic life. Due to the uncertainties associated with the use of biological effects associated with the results of the risk assessment, L. E. Carpenter conducted a community level biological assessment of sediment in the Rockaway River, specifically to evaluate if present site conditions are impacting the benthic macroinvertebrate community of the Rockaway River. The assessment concluded that historical operations on-site and current conditions of the site do not appear to be impacting the biological community in the sediment or aquatic species of the Rockaway River.

SCOPE AND ROLE OF ACTION

This proposed plan will address all contaminated media determined to pose a threat to human health and the environment at the L. E. Carpenter site. The overall site remediation has been conducted in a phased approach to reduce the contaminant migration pathways and minimize exposure. The following media will be addressed in the remedial action:

* Soil - DEHP
* Soil (hot spots) - Lead, Antimony, PCBs
* Ground water - Xylene, Ethylbenzene, DEHP

L. E. Carpenter has performed an initial removal action of contaminated soils from the sludge impoundment area and has removed numerous underground storage tanks. The floating product on the ground water is being addressed by use of a passive recovery system which has been upgraded twice since original startup in 1982.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives are specific goals to protect human health and the environment; they specify the contaminant(s) of concern, the exposure route(s), receptor(s), and acceptable level(s) for each exposure route. These objectives are based on available information and standards such as applicable or relevant and appropriate requirements (ARARs) and risk-based levels established in the risk assessment.

The following remedial action objectives were established:

Soil Contaminant	Remediation Goal, ppm
DEHP	100
Xylene	10
Ethylbenzene	100
Lead	600
Antimony	340
PCBs	2*

* Based upon the enactment of a Declaration of Environmental Restriction on the Wharton Enterprises property.

Ground water Contaminant	Remediation Goal, ppb
DEHP	30
Xylene	40
Ethylbenzene	700
Antimony	20
Arsenic	8

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA requires that each selected remedy be protective of human health and the environment, be cost effective, comply with other statutory laws, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statue includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

The Feasibility Study (FS) report includes a preliminary screening of all potentially applicable technologies, followed by elimination of inappropriate or infeasible alternatives and identification of applicable technologies based solely on technical considerations. The resultant technologies are then developed into remedial alternatives. The FS report evaluated in detail six remedial alternatives for addressing the contamination associated with the L. E. Carpenter site.

The alternatives are:

1. No Action
2. Institutional Controls
3. Containment
4. Treating Contaminated Ground Water with Reinfiltration
5. Excavation of Soil/On-Site Washing/Bioslurry Treatment
6. Excavation of Soil/Thermal Treatment

The following is a descriptive analysis of each evaluated alternative:

These alternatives are:

Alternative 1: No Action

Capital Cost: $0.00
O & M Cost: $79,000/year
Present Worth Cost: $1,215,000
Time to Implement: immediate

The Superfund program requires that the "no action" alternative be considered as a baseline for comparison of other alternatives. Under the no action alternative, no additional remedial actions would be initiated beyond passive recovery of the floating product as specified in the 1986 Amended ACO. The no action alternative would be appropriate if the potential endangerment is negligible or if implementation of a remedial action would result in a greater potential risk. Because this alternative would result in contaminants remaining on-site in excess of health based levels, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the waste.

Alternative #2: Institutional Controls

Capital Cost: $50,000
O & M Cost: $90,000/year
Present Worth Cost: $1,434,000
Time to Implement: Four months

The alternative involves a filing of Declaration of an Environmental Restriction with the county recording officer pursuant to ISRA, Section 36(2) and engineering controls; ground water use restriction; an expanded ground water monitoring program; maintenance of existing site fencing and; continuation of passive recovery of floating product. The deed notations would be written to restrict future use of the property to non-residential use due to the presence of contaminants above NJDEPE's residential standards. Ground water restriction involves designation of local ground water sources as nonpotable with delineation of a corresponding well restriction area. The expanded monitoring program requires installation and quarterly sampling of a sentinel well on the Air Products property. Because this alternative would result in contaminants remaining on-site in excess of health-based levels, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the waste.

Alternative #3: Containment

Capital Cost: $ 5,716,000
O & M Cost: $ 205,000/year
Present Worth Cost: $ 8,900,000
Time to Implement: 33 months

This alternative involves the following remedial actions; soil cover for DEHP contaminated soil; spot excavation and offsite disposal of isolated metal contaminated surficial soil; active immiscible product recovery; biological treatment of ground water. A soil cover would be designed to allow natural precipitation to infiltrate into the vadose zone soils to allow natural attenuation of soil contaminants to continue. The cover would mitigate the threat of direct contact, ingestion, inhalation or erosion of soil contaminants. Hot spot excavation and off-site disposal of metal and PCB contaminated soils would be performed. Contaminated soil which do not meet the land disposal requirements (LDRs) designated for off-site disposal would be treated prior to disposal. Ground water will be extracted then treated by an above ground biological treatment system with a portion of it recirculated within a capture zone. Remaining treated ground water will be discharged into a deeper aquifer. Such treatment will occur after all immiscible product has been removed by an active recovery system. The biological treatment system would include equalization/nutrient mix tank, bioreactor vessel, effluent polishing treatment, and vapor phase granular activated carbon (GAC) treatment for volatile organics. Appropriate ground water discharge permits and air permit for the treatment system would be obtained. Institutional controls may be required because this alternative will result in contaminants remaining on-site above residential health based criteria. Pursuant to CERCLA the site would be reviewed every five years until soil clean up criteria was achieved. If justified by the review, remedial actions may be implemented to remove or treat the waste.

Alternative #4: Treated Ground water with Reinfiltration/ Soil Biodegradation

Capital Cost: $8,452,000
O & M Cost: $210,000/year
Present Worth Cost: $11, 200,000
Time to Implement: 36 months

Alternative 4 consists of extraction of contaminated ground water, above ground enhanced biological treatment and the addition of oxygen and nutrients and possibly a surfactant prior reinfiltration of ground water to the shallow aquifer zone within a treatment basin. Biological treatment will occur after all immiscible product has been removed through a active removal system. A portion of the treated ground water will be recycled within a capture system for the purpose of flushing and stimulating in situ biological activities of the soils. The ground water infiltration system would be covered with a soil and vegetative cover to preclude direct contact with contaminated soils prior to final restoration. In-situ biological activity

is designed to clean up soils with microbes which would degrade organic contaminants adhering to soil particles. The ground water capture system will be designed to ensure treated ground water will be recaptured by a series of extraction wells. The remaining final treated effluent will be discharged into a deeper aquifer. Appropriate ground water discharge permits and air permit for the treatment system would be obtained. As with Alternative 3, hotspot excavation and disposal of isolated soils located outside the treatment zone would be performed. Soils to be disposed of off-site would meet all applicable RCRA treatment and disposal criteria. Institutional controls would be required because this alternative may result in contaminants remaining on-site in excess of the NJ residential soil cleanup criteria. A site review every 5 years is required pursuant to CERCLA until health based levels are met. If justified by the review, remedial actions may be implemented to remove or treat the waste.

Alternative 5: Excavation/On-site Soil Washing/Bioslurry Treatment/ Treatment of Ground water

Capital Costs: $ 32,191,000
O & M Cost: $ 205,000/year
Present Worth: $34,000,000
Time to Implement: 39 months

Alternative 5 consists of excavation of contaminated soil, on-site soil washing of excavated soils; and placement of the cleaned soil back on-site; treatment of ground water through above ground biological treatment after immiscible product has been removed through active recovery system as explained in Alternative 3. The soil will be treated in a bioslurry reactor to destroy the organic contaminants. The scrubbing action of the soil washing technology would remove any leachable organics and metals contained in the soils. Process wash water will be treated prior to recycling in the soil washer. Soil excavation and off-site disposal of isolated hot spot areas would still be required under this alternative. All ground water process treatments described in Alternative 3 are included in this alternative. On site treated waste would be subject to land disposal restrictions (LDRs). Applicable water, air and wetlands permits would be required. Institutional controls would be required because this alternative may result in contaminants remaining on-site in excess of the NJ residential soil cleanup criteria. A site review every 5 years is required pursuant to CERCLA until health based levels are met. If justified by the review, remedial actions may be implemented to remove or treat the waste.

Alternative #6: Soil Excavation/Thermal Treatment/ Treatment of Ground water

OPTION A
Capital Cost: $43,991,000
O & M Cost: $205,000/year
Present Worth Cost: $46,000,000
Time to Implement: 45 months

OPTION B
Capital Cost: $85,140,000
O & M Cost:$205,000/year
Present Worth Cost: $88,000,000
Time to Implement: 30 months

Alternative 6 consists of excavation of organic contaminated soils greater than remedial goals and destruction of the organic constituents via thermal treatment by incineration. Under this alternative, two options (A and B) are considered. Option A provides for on-site incinerator, for example a rotary kiln incinerator, to thermally treat the contaminated soils. In Option B, all soils are transported off-site to a commercial RCRA permitted incinerator for treatment. Option A allows for potential backfilling of the excavation with stabilized incinerator ash. Option B allows the excavated area to be backfilled with clean fill. Isolated hot spot soil areas contaminated with metals or PCBs will be disposed of off-site. Under either option, treatment of soils must meet LDR for off or on site disposal. Option A requires various state permits for water, air, and wetlands disturbance. Option B would require meeting Federal DOT transportation and RCRA requirements. All ground water process treatments described in Alternative 3 are included in this Alternative. Institutional controls would be required because this alternative may result in contaminants remaining on-site in excess of the NJ residential soil cleanup criteria. A site review every 5 years is required pursuant to CERCLA until health based levels are met. If justified by the review, remedial actions may be implemented to remove or treat the waste.

EVALUATION OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against the nine evaluation criteria. Overall protection of human health and the environment, compliance with applicable or relevant and appropriate requirements, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume, short-term effectiveness, implementability, cost, and EPA and community acceptance.

The evaluation criteria are described below.

- Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

- Compliance with applicable or relevant and appropriate requirements (ARARs) addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and requirements or provide grounds for invoking a waiver.

- o Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

- o Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies a remedy may employ.

- o Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

- o Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

- o Cost includes estimated capital and operation and maintenance costs, and net present worth costs.

- o EPA acceptance indicates whether, based on its review of the RI/FS reports and Proposed Plan, the EPA concurs, opposes, or has no comment on the preferred alternative at the present time.

- o Community acceptance will be assessed in the Record of Decision (ROD) following a review of the public comments received on the RI/FS reports and the Proposed Plan.

A comparative analysis of the alternatives based upon the evaluation criteria noted above follows:.

- o Overall Protection of Human Health and the Environment

Alternative #1, no action, would not be protective of human health and the environment. Current levels of DEHP and PCBs in the soil and DEHP, xylene and ethylbenzene in ground water pose an unacceptable risk. By restricting access and ground water usage, Alternative #2 provides greater protection, but not to the future on-site worker and potential contact with contaminated soil. In addition, the potential for off-site migration of contaminated ground water is likely. Alternative #3 through #6 involve ground water treatment and reduction of soils contamination. Alternative #3 and #4 preclude direct contact with surface soils through the installation of a soil cover. In Alternatives #5 and #6, contaminated soil is excavated and treated either on-site or off-site. The flushing of soil via ground water extraction will aid in the removal of soil contaminants in the saturated zone. Should institutional and engineering controls be implemented, then Alternative 3 through 6 are equally protective of human health and the environment.

- o Compliance with ARARs

Alternatives #1 and #2 would not meet the 1 x 10^{-6} NJ remediation standard at the L. E. Carpenter site nor the NJ Ground water Quality standards. Alternatives #3 through #6 employ bioremediation for ground water treatment. Bioremediation of target organic compounds will attain ARARs. Under Alternative 3, soils containing DEHP in excess of the remediation goals would remain for a period subject to natural attenuation. In situ bioremediation is effective for treating organic contaminated soils under Alternative #4 and therefore should meet remediation goals. Alternatives #5 and #6 should meet remediation goals. All alternatives would meet the air requirements. Each alternative is anticipated to meet action and location specific ARARs at the site.

- o Long-Term Effectiveness and Permanence

Alternatives #1 and #2 offer limited long-term effectiveness. The potential of migration of contaminated ground water in addition to not meeting the remediation goals exist at the site. Alternatives 3 through 6 offer effectiveness through the ground water treatment component. Bioremediation and soil flushing contaminates in ground water and soil will be effective at the L. E. Carpenter site. Alternative #3 can provide long term effectiveness as long as the soil cover was properly maintained and institutional controls are in place. However, the DEHP contaminated soils may warrant a five year review. Alternatives #4 through #6 permanently remove contaminants form the soil.

- o Cost

Alternative #1's present worth cost is approximately $1.2 M. The primary component would be to maintain the passive recovery system until all immiscible product had been removed. Alternative #2's present worth cast is approximately $1.4 M. The primary component would be to maintain institutional controls, passive recovery system and ground water monitoring program. Alternative #3's present worth cost is $9.5 M. The primary components are hotspot removal, maintenance of soil cover, institutional controls and ground water remediation using bioremediation. Alternative #4's present worth cost is $11.8 M. The primary components are hotspot removal, bioremediation of ground water and soil. Alternative #5 present worth cost is $35 M. The primary components are hotspot removal, soil washing, and bioremediation of ground water. Alternative #6A's present worth cost is $47 M. The primary components are hotspot removal on-site soil incineration and bioremediation ground water. Alternative #6B's present worth cost is $89 M. The primary components are off-site soil incineration and bioremediation of ground water.

- o Reduction in Toxicity, Mobility or Volume

Alternatives #1 and #2 do not offer reduction in toxicity, mobility or volume of contaminated materials except removal

of immiscible product from ground water. Alternate #3 does not involve active soil treatment and relies on natural attenuation and therefore does not fully satisfy this criterion. All other alternatives will satisfy this criterion.

o Short Term Effectiveness

Alternatives #1 and #2 would not offer any short term effectiveness except for restricted use of the property through institutional controls. Alternatives #3 and #4 have the greatest short term effectiveness because remedial alternatives are less intrusive than Alternatives #5 and #6 plus they offer soil cover for dust control. Alternatives #5 and #6 indicate wetlands disturbance which would be mitigated upon the completion of the remediation.

o Implementability

Alternatives #1 and #2 are the simplest alternatives to implement from a technical standpoint since the passive recovery system is already in place. The operations associated with #3 and #4 offer a combination of well established, readily available construction methods and innovative technology which may require additional design coordination. Major limitations are associated with the implementation of Alternatives #5 and #6 due to the phases of remediation and the time required for each. Incinerators usually are not well received by the community and the approval process may delay the implementation of Alternative #6.

o EPA Acceptance

EPA has reviewed and commented on the proposed plan. Pursuant to the EPA/State Pilot Agreement dated December 1992, EPA concurrence on this plan is not a prerequisite to NJDEPE selecting a remedy.

o Community Acceptance

Community acceptance of the preferred alternative will be assessed in the ROD following the public meeting review of the public comments received on the RI/FS report and the Proposed Plan.

PREFERRED ALTERNATIVE

Based upon an evaluation of the various alternatives, NJDEPE recommend Alternative #4, (Treatment of Ground water with Reinfiltration and Soil Bioremediation) as the proposed remedy for the L. E. Carpenter site.

Biological Treatment of extracted ground water and soils would involve the extraction of ground water followed by treatment and reintroduction to the subsurface soils. Isolated areas of metal and PCB contaminated soils will be removed and disposed of off-site. In situ treatment offers the potential for degradation of soil contaminants without the need for extensive excavation and disturbance, although will take longer than Alternatives #5 and #6 to reach the soil remediation goals. Active recovery and ground water capture will limit the migration of contaminated ground water. Soil and ground water contaminants will be reduced to meet the soil and ground water remedial action objectives described in this proposed plan and will be protective of both human health and the environment. This alternative offers minimal disturbance of soil from remediation activity due to uninvasive activities except hotspot removal, thereby reducing the amount of airborne dust and noise disturbance to the surrounding community. The planned soil cover will reduce the direct contact and inhalation risks during remediation.

This alternative satisfies the remedial action objectives and the substantive requirements of CERCLA the National Contingency Plan, and the amended ACO.

The preferred alternative achieves the ARARs more quickly, or as quickly, and at less cost than the other options. The preferred alternative will provide the best balance of trade-offs among alternatives with respect to the evaluating criteria. NJDEPE believes that the preferred alternative will be protective of human health and the environment, will comply with ARARs, will be cost effective, and will utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The remedy also will meet the statutory preference for the use of treatment as a principal element.

The preferred alternative is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

GLOSSARY
Of Terms Used In the Proposed Plan

This glossary defines the technical terms used in this Proposed Plan. The terms and abbreviations contained in this glossary are often defined in the context of hazardous waste management, and apply specifically to work performed under the Superfund program. Therefore, these terms may have other meanings when used in a different context.

Administrative Consent Order: A legal and enforceable agreement between EPA and the potentially responsible parties (PRPs). Under the terms of the Order, the PRPs agree to perform or pay for site studies or cleanup work. It also describes the oversight rules, responsibilities and enforcement options that the government may exercise in the event of noncompliance by the PRPs. This Order is signed by the PRPs and the government; it does not require approval by a judge.

Ambient air: Any unconfined part of the atmosphere. Refers to the air that may be inhaled by workers or residents in the

vicinity of contaminated air sources.

Aquifer: An underground layer of rock, sand, or gravel capable of storing water within cracks and pore spaces, or between grains. When water contained within an aquifer is of sufficient quantity and quality, it can be tapped and used for drinking or other purposes. The water contained in the aquifer is called ground water.

Backfill: To refill an excavated area with removed earth; or the material itself that is used to refill an excavated area.

Bioremediation: A cleanup process using naturally occurring or specially cultivated microorganisms to digest contaminants naturally or and break them down (biodegrade) into nonhazardous components.

Bioslurry: A form of bioremediation which occurs in an above ground unit.

Carbon adsorption/carbon treatment: A treatment system in which contaminants are removed from ground water and surface water by forcing water through tanks containing activated carbon, a specially treated material that attracts and holds or retains contaminants.

Containment: The process of enclosing or containing hazardous substances in a structure, typically in ponds and lagoons, to prevent the migration of contaminants into the environment.

EPA/State Pilot Agreement: An agreement entered into by the EPA and NJDEPE which delineate the respective roles and responsibilities of each Party as they relate to the conduct of the oversight of this site or project.

Effluent: Wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.

Soil Washing: A cleanup process which removes contaminants and/or fine soil particles to which they are adsorbed by contacting soil particles with reagents that consist of a water/surfactant or water/solvent solution.

Thermal Treatment: Cleanup technologies which rely upon relatively high temperatures to either destroy organic contaminants or separate them from natural materials. Incineration and Rotary Kiln Incineration are examples of "Thermal treatment".

Use Restriction: A form of institutional control in which a notice of filed with the office of the county recording officer, in the county in which the property is located, to inform prospective holders of an interest in the property that contamination exists on the property at a level that may statutorily restrict certain uses of or access to all or part of that property, a delineation of those restrictions, a description of all specific engineering or institutional controls at the property that exist and that shall be maintained in order to prevent exposure to contaminants remaining on the property, and the written consent to the notice by the owner of the property. Use restrictions are filed as DECLARATION OF ENVIRONMENTAL RESTRICTIONS.

Volatile Organic Compounds (VOCs): VOCs are made as secondary petrochemicals. They include light alcohols, acetone,trichloroethylene,perchloroethylene,dichloroethylene, benzene, vinyl chloride, toluene, and methylene chloride. These potentially toxic chemicals are used as solvents, degreasers, paints, thinners, and fuels. Because of their volatile nature, they readily evaporate into the air, increasing the potential exposure to humans. Due to their low water solubility, environmental persistence, and wide- spread industrial use, they are commonly found in soil and ground water.

Wetland: An area that is regularly saturated by surface or ground water and, under normal circumstances, capable of supporting vegetation typically adapted for life in saturated soil conditions. Wetlands are critical to sustaining many species of fish and wildlife. Wetlands generally include swamps, marshes, and bogs. Wetlands may be either coastal or inland. Coastal wetlands have salt or brackish (a mixture of salt and fresh) water, and most have tides, while inland wetlands are non-tidal and freshwater. Coastal wetlands are an integral component of estuaries.

Anthony Cinque
<Anthony.Cinque@dep.state.nj.us>

02/08/2005 08:34 AM

To: Nicholas.Clevett@rmtinc.com
cc: John Prendergast <John.Prendergast@dep.state.nj.us>, Stephen Cipot/R2/USEPA/US@EPA
Subject: Re: LEC - Preconstruction Boring Report (RMT, January 2005)

Nick,

what exactly do you mean by incomplete? This did not affect delineation data did it? please clarify.

Anthony

>>> "Nicholas Clevett" <Nicholas.Clevett@rmtinc.com> 02/07/05 12:59PM >>>
Gentlemen -

After looking at our internal file copy of the above reference report, I am concerned that the data presented in Appendix B (i.e., PCB soils sampling results and Laboratory Analytical Reports) were incomplete. Subsequently, please find attached tabulated results for the Nov and Dec
2004 sampling rounds (2 files) and 3 laboratory reports files containing
the 2nd round data collected in Dec 2004. Please print and add these files to your hard copies.

Sorry For the Inconvenience.
Nick

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02/07/2005 12:59 PM

To: Anthony.Cinque@dep.state.nj.us, Stephen Cipot/R2/USEPA/US@EPA, cristopher.anderson@Polyone.com, Ernie.Schaub@Polyone.com
cc: Jim Dexter <Jim.Dexter@rmtinc.com>
Subject: LEC - Preconstruction Boring Report (RMT, January 2005)

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PCBresults Dec 2004.p PCBresults Nov 2004.p

PCB Round 2c 924586-L. E. Carpenter 12-11-2004 09-00

PCB Round 2B 924587-L. E. Carpenter 12-11-2004 09-50

PCB Round 2A 924585-L. E. Carpenter 12-11-2004 09-50